

..... **A FERROELECTRIC CERAMIC COMPOUND, A FERROELECTRIC CERAMIC SINGLE CRYSTAL, AND PREPARATION PROCESSES THEREOF**

ABSTRACT OF THE DISCLOSURE

The present invention relates to a ferroelectric ceramic compound having the composition of the following formula: $s[L]-x[P]y[M]z[N]p[T]$, a ferroelectric ceramic single crystal, and preparation processes thereof. The ferroelectric ceramic compound and the single crystal according to the present invention are relaxor ferroelectrics having high piezoelectricity, a high electromechanical coefficient and a high electrooptical coefficient, and are useful for manufacturing tunable filters for radio communication, optical communication devices, surface acoustic wave devices, and the like. Particularly, the process of preparing the single crystal according to the present invention enables preparation of a single crystal having a diameter of 5 cm or greater and a single crystal wafer with uniform composition. In the formula, [P] is lead oxide, [M] is magnesium oxide or zinc oxide, [N] is niobium oxide, [T] is titanium oxide, [L] is one selected from the group consisting of lithium tantalate or lithium niobate, lithium, lithium oxide, platinum, indium, palladium, rhodium, nickel, cobalt, iron, strontium, scandium, ruthenium, copper, yttrium, and ytterbium or mixtures thereof, and x, y, z, p and s are defined as $0.55 < x < 0.60$, $0.09 < y < 0.20$, $0.09 < z < 0.20$, $0.01 < p < 0.27$ and $0.01 < s < 0.1$, respectively.